4. (Once Amended) The method of Claim 1 wherein said labeled anti-halogenated nucleotide (anti-HdN) antibody is selected from the group consisting of fluorescently labeled anti-HdN monoclonal antibody; radiolabeled anti-HdN monoclonal antibody; peroxidase-labeled anti-HdN monoclonal antibody; chromophore labeled anti-HdN monoclonal antibody; fluorescently labeled anti-HdN polyclonal antibody; radiolabeled anti-HdN polyclonal antibody; peroxidase-labeled anti-HdN polyclonal antibody; and chromophore labeled anti-HdN polyclonal antibody.

a3

5. (Once Amended) A method for labeling nuclear DNA strands within a cell, comprising the steps of:

a. incubating said cell containing said DNA strands with brominated deoxynucleotide triphosphate (BrdNTP) and an enzyme that catalytically attaches the brominated deoxynucleotide (BrdN) of said BrdNTP onto the 3' OH ends of said DNA strands; and

b. reacting the resulting BrdN-DNA strands without denaturation of the DNA with a labeled anti–brominated deoxynucleotide (anti-BrdN) antibody which specifically binds to said BrdN.

7. The method of Claim 5 wherein said enzyme is selected from the group consisting of terminal deoxynucleotidyl transferase (TdT) and DNA polymerase.

a4

8. (Once Amended) The method of Claim 5 wherein said labeled antibrominated nucleotide (anti-BrdN) antibody is selected from the group consisting of fluorescently labeled anti-BrdN monoclonal antibody; radiolabeled anti-BrdN monoclonal antibody; peroxidase-labeled anti-BrdN monoclonal antibody; chromophore labeled anti-BrdN monoclonal antibody; fluorescently labeled anti-BrdN polyclonal antibody; radiolabeled anti-BrdN polyclonal antibody; peroxidase labeled anti-BrdN polyclonal antibody; and chromophore labeled anti-BrdN polyclonal antibody.

a4

9. (Once Amended) A method for labeling nuclear DNA strands within a cell, comprising the steps of:

a. incubating said cell containing said DNA strands with brominated deoxyuridine triphosphate (BrdUTP) and an enzyme that catalytically attaches the brominated uridine (BrdUrd) of said BrdUTP onto the 3' OH ends of said DNA strands; and

b. reacting the resulting BrdUrd-DNA strands without denaturation of the DNA with a labeled anti-brominated uridine (anti-BrdUrd) antibody which specifically binds to said BrdUrd.

10. The method of Claim 9 wherein said enzyme is selected from the group consisting of terminal deoxynucleotidyl transferase (TdT) and DNA polymerase.

11. (Once Amended) The method of Claim 9 wherein said anti-brominated uridine (anti-BrdUrd) antibody is selected from the group consisting of fluorescently labeled anti-BrdUrd monoclonal antibody; radiolabeled anti-BrdUrd monoclonal antibody; peroxidase labeled anti-BrdUrd monoclonal antibody; chromophore labeled anti-BrdUrd monoclonal antibody; fluorescently labeled anti-BrdUrd polyclonal antibody; radiolabeled anti-BrdUrd polyclonal antibody; peroxidase-labeled anti–BrdUrd polyclonal antibody; and chromophore labeled anti–BrdUrd polyclonal antibody.

a4

12. (Once Amended) A method for detecting breaks in nuclear DNA strands, within a cell comprising the steps of:

a. incubating said cell containing said DNA strands with brominated deoxyuridine triphosphate (BrdUTP) and an enzyme that catalytically attaches the brominated uridine (BrdUrd) of said BrdUTP onto the 3' OH ends of said DNA strands;

b. reacting [the] any resulting BrdUrd-DNA strands with a labeled anti-brominated uridine (anti-BrdUrd) antibody which specifically binds to said BrdUrd; and

c. detecting said [label] labeled antibody whereby detected cells contain DNA strands having breaks.

13. The method of Claim 12 wherein said enzyme is selected from the group consisting of terminal deoxynucleotidyl transferase (TdT) and DNA polymerase.

14. (Once Amended) The method of Claim 12 wherein said labeled antibrominated uridine (anti-BrdUrd) antibody is selected from the group consisting of fluorescently labeled anti-BrdUrd monoclonal antibody; radiolabeled anti-BrdUrd monoclonal antibody; peroxidase-labeled anti-BrdUrd monoclonal antibody; chromophore labeled anti-BrdUrd monoclonal antibody; fluorescently labeled anti-BrdUrd polyclonal antibody; radiolabeled anti-BrdUrd polyclonal antibody; peroxidase-labeled anti-BrdUrd polyclonal antibody; and chromophore labeled anti-BrdUrd polyclonal antibody.

a4

15. (Once Amended) The method of Claim 12 wherein said labeled antibrominated uridine (anti-BrdUrd) antibody is selected from the group consisting of fluorescently labeled anti-BrdUrd monoclonal antibody and fluorescently labeled anti-BrdU: polyclonal antibody, and said detecting is accomplished by a method selected from the group consisting of flow [cytometery] cytometry, fluorescence microscopy, multiparameter laser scanning microscopy, and visual observation during irradiation with light of [the] an excitation wavelength.

16. (Once Amended) The method of Claim 12 wherein said labeled antibrominated uridine (anti-BrdUrd) antibody is selected from the group consisting of radiolabeled anti-BrdUrd monoclonal antibody and radiolabeled anti-BrdUrd polyclonal antibody, and said detecting is accomplished by a method selected from the group consisting of scintillation counting, autoradiography, and [geiger] Geiger counting.

17. (Once Amended) A method for detecting whether cells have undergone apoptosis, comprising the steps of:

a. [Fixing] fixing said cells;

b. incubating said cells with brominated deoxyuridine triphosphate (BrdUTP) and an enzyme that catalytically attaches the brominated uridine (BrdUrd) of said BrdUTP onto the 3' OH ends of DNA strands in said cells;

a4

c. reacting the resulting BrdUrd-DNA strands with a labeled anti-brominated uridine (anti-BrdUrd) antibody which specifically binds to said BrdUrd; and

d. detecting said [label] labeled antibody, [wherein] whereby apoptosis is confirmed by the detection of label at a level more than about two standard deviations above the mean level of label found in identically treated [contol] control samples known not to have undergone apoptosis.

18. The method of Claim 17 wherein said enzyme is selected from the group consisting of terminal deoxynucleotidyl transferase (TdT) and DNA polymerase.

19. (Once Amended) The method of Claim 17 wherein said labeled antibrominated uridine (anti-BrdUrd) antibody is selected from the group consisting of fluorescently labeled anti-BrdUrd monoclonal antibody; radiolabeled anti-BrdUrd monoclonal antibody; peroxidase-labeled anti-BrdUrd monoclonal antibody; chromophore labeled anti-BrdUrd monoclonal antibody; fluorescently labeled anti-BrdUrd polyclonal antibody; radiolabeled anti-BrdUrd polyclonal antibody; peroxidase-labeled anti-BrdUrd polyclonal antibody; and chromophore labeled anti-BrdUrd polyclonal antibody.

20. (Once Amended) The method of Claim 17 wherein said labeled antibrominated uridine (anti-BrdUrd) antibody is selected from the group consisting of fluorescently labeled anti-BrdUrd monoclonal antibody and fluorescently labeled anti-BrdUrd polyclonal antibody, and said detecting is accomplished by a method selected from the group consisting of flow [cytometery] cytometry, fluorescence microscopy, multiparameter laser scanning microscopy, and visual observation during irradiation with light of [the] an excitation wavelength.